

REMARKS

Claims 6 through 7, 29 through 32 and 36 through 38 are in the application. No claim amendments are made in this paper. Claims 6 and 31 are the independent claims herein. No new matter has been added. Reconsideration and further examination are respectfully requested.

Claim Rejections – 35 USC § 103(a)

Claims 6-7, 29-32, and 36-38 are rejected as being obvious over U.S. 6,392,898 to Asai et al. in view of U.S. Patent No. 6,373,719 to Behling et al. or U.S. Patent No. 6,068,782 to Brandt et al.

The Examiner relies on the Asai and Behling references in rejecting the sole independent claims, which are claims 6 and 31. However, as discussed in more detail below, those cases are of little relevance to the subject matter claimed in this application, and do not support the Examiner's reliance thereon.

Claim 6 remains directed to an "apparatus" that includes "a substrate" and "a pair of signal traces formed directly on the substrate and spaced from each other". The apparatus of claim 6 further includes "a filler material directly on the substrate and between the signal traces". In addition, claim 6 specifies that "the filler material ha[s] a dielectric constant that is higher than a dielectric constant of a material of which the substrate is formed". Further, the apparatus of claim 6 includes "a solder mask layer directly on the signal traces and directly on the filler material" with "the dielectric constant of the filler material being higher than a dielectric constant of the solder mask layer". Finally, claim 6 specifies that the filler material has a height that is substantially equal to a height of the signal traces.

In attempting to find elements of claim 6 in the Asai reference, the Examiner asserts that element 34U of Asai satisfies the claimed "pair of signal traces".¹ This assertion by the Examiner is not supported by what is actually disclosed in the reference. The passage at column

¹ Inconsistently with the Examiner's identification of element 34U as allegedly satisfying the claimed signal traces, the Examiner refers in the last line on page 2 of the pending Office Action to "signal traces 43a/44a". However, there are no elements identified as 43a or 44a in the Asai reference. Applicants believe that this reference to elements 43a/44a was a typographically erroneous carry-over from the reference to those elements in the Office Action dated Feb. 3, 2006.

6, lines 13-14 of Asai, cited by the Examiner, states that copper pattern 34U is a “ground layer”, not signal traces.

Applicants also note that the purpose of Asai’s disclosure is to prevent warping of a package board by putting a dummy metal pattern on the IC side of the package board to balance out the amount of metal on the two sides of the package board. (See column 3, lines 46-62.) This has nothing to do with the present patent application, which is concerned with improving the performance of differential signal traces. The Asai reference does not in any respect concern itself with differential signal traces.

The Examiner has also identified certain elements of the Behling reference, namely elements 34 and 36, as being “signal traces”. Again, this reference does not support the Examiner’s position. In fact, element 34 in Behling is a “contact portion” for a solder ball 44 (column 5, lines 3-7), and element 36 is a “ground bar” (column 4, lines 21-22). Thus neither element 34 nor 36 in Behling is a signal trace.

Moreover, the Behling reference, like Asai and unlike the present application, has nothing to do with improving performance of differential signal traces. Rather, Behling is concerned with providing overvoltage protection for electronic circuits.

Thus neither reference in any way teaches or suggests placing a filler material (allegedly satisfied by Behling’s “variable voltage material 40) between two signal traces, since both references do not even show a pair of signal traces. It is therefore respectfully submitted that the pending rejection of claim 6 is fundamentally flawed and should be withdrawn.


The remarks made above with respect to claim 6 are also applicable to the other independent claim, which is claim 31.²

² Applicants note in passing, and for the fourth time, that element 120 in the Brandt reference cannot be the claimed high dielectric constant filler material since it is explicitly stated at column 2, lines 19-24 in Brandt to be a low dielectric constant insulator.

CONCLUSION

Accordingly, Applicants respectfully request allowance of the pending claims. If any issues remain, or if the Examiner has any further suggestions for expediting allowance of the present application, the Examiner is kindly invited to contact the undersigned via telephone at (203) 972-3460.

Respectfully submitted,



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